ACCESSION #: 9610280167

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Donald C. Cook Nuclear Plant - Unit 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000315

TITLE: Main Generator Trip on Main Transformer Sudden

Overpressure Due to Lighting Strike Causes Reactor Trip

EVENT DATE: 09/22/96 LER #: 96-004-00 REPORT DATE: 10/22/96

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 88

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Michael Finissi, Nuclear

Engineering - System Engineering

Mechanical Systems TELEPHONE: (616/465-5901, x1045)

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On September 22, 1996, at 0049 hours with Unit 1 in Mode 1 at 88 percent power, a Unit 1 Main Transformer Sudden Pressure Trip (SPT) signal was received. This signal caused a Main Generator trip, which in turn, caused a reactor trip. This event is being reported in accordance with 10CFR50.73(a)(2)(iv), as any event or condition that results in a manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor

Protection System (RPS).

The Main Transformer Sudden Pressure trip signal is attributed to a confirmed lighting strike which occurred approximately 200 milliseconds prior to the receipt of the SPT signal. The lightning strike was a through fault and seen by the Main Generator, but was not considered a large magnitude transient when compared with previous strikes at the site.

The SPT relay was tested and replaced due to inconsistent performance. The balance of the SPT relay circuitry was tested and found to be satisfactory. Transformer oil sample analysis was performed and verified that the SPT signal was spurious.

After the reactor trip, all safety systems operated normally in response to the trip signal and all post reactor trip responses were normal. The reactor was stabilized in Mode 3, Hot Standby. This event was evaluated and determined to have no actual or potential adverse effect on the health and safety of the public.

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Conditions Prior to Event

Mode 1, Power Operation, at 88 percent Rated Thermal Power

Description of Event

On September 22, 1996, at 0048 hours, Unit 1 was operating at 88 percent

power with all safety systems operational. Surveillance procedure 01 OHP

4030 STP.027AB, "AB Diesel Generator Operability Test", on the Unit 1 AB

Emergency Diesel Generator (EDG) was nearing successful completion with

the EDG running, but not loaded.

At 0048 hours 54 seconds, during a thunderstorm, both the Unit 1 and Unit

2 oscillographs recorded a lightning strike. The Unit 1 oscillograph

initiated due to a Main Generator undervoltage condition which resulted

from the strike. Although the Unit 2 oscillograph started, no other

events occurred on that unit.

Approximately 200 milliseconds after the strike, the Operations Sequence Monitor (OSM) picked up a Unit 1 Main Transformer Sudden Pressure Trip (SPT) signal event. The SPT signal operated the Unit Differential Relays. The reactor trip breakers opened approximately 400 milliseconds after initial receipt of the SPT relay signal, due to the receipt of a turbine trip signal. The reactor trip officially occurred at 0049 hours. All safety systems operated normally and the unit was stabilized in Mode 3 at normal post trip no load pressure and temperature.

Cause of Event

The Main Transformer Sudden Pressure trip signal is attributed to the confirmed lighting strike which occurred approximately 200 milliseconds prior to the initiation of the SPT relay signal. The lightning strike was a through fault and seen by the Main Generator, but was not considered a large magnitude transient when compared with previous strikes at the site.

The transformer and the SPT relay were both investigated to determine if a transformer fault produced the trip. The analysis performed on oil taken from the transformer after the event showed results comparable to results of analysis performed on the same transformer 3 days prior to the trip. No gas or gas bubbles were found in the SPT relay gas accumulation chamber. Transformer conservator level was as expected for ambient conditions and oil temperature. All investigative results indicated that no damage occurred to the transformer as a result of the lightning

strike, and that the SPT relay signal was most likely spurious.

Analysis of Event

This event is being reported in accordance with 10CFR50.73(a)(2)(iv), as any event or condition that results in a manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS). The RPS signal was in response to a turbine trip signal, which originated with the Main Transformer Sudden Pressure Trip relay signal.

Normal offsite power was available, the CD Emergency Diesel Generator was in standby and the AB EDG was running unloaded. No safety equipment was out of service prior to the trip. After the reactor trip, all safety systems operated normally in response to the trip signal and all post reactor trip responses were normal. This event was evaluated and determined to have no actual or potential adverse effect on the health and safety of the public.

Corrective Actions

The SPT relay was tested and replaced due to inconsistent performance. The balance of the SPT relay circuitry was tested and found to be satisfactory. Transformer oil sample analysis was performed and verified that the SPT signal was spurious.

Failed Component Identification

Not Applicable

Previous Similar Events

None

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American Electric Power

Cook Nuclear Plant

One Cook Place

Bridgman, MI 49106

616 465 5901

AEP

AMERICAN

ELECTRIC

POWER

October 22, 1996

United States Nuclear Regulatory Commission

Document Control Desk

Rockville, Maryland 20852

Operating Licenses DPR-58

Docket No. 50.315

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled

Licensee Event Report System, the following report is being submitted:

96-004-00

Sincerely,

A. A. Blind

Site Vice President

/mbd

Attachment

c: A. B. Beach, Region III

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NRC Resident Inspector

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